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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,141	06/20/2003	Charles K. Rhodes	UIC.02USU1 (CV107/NPU)	8476

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EXAMINER	
VANNUCCI, JAMES	
ART UNIT	**PAPER NUMBER**
2828	

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/600,141	RHODES ET AL.	
	Examiner	Art Unit	
	Jim Vannucci	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ~~3-3-05~~. 3/30/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silfvast(4,592,064) in view of Lo(4,940,893).

Claims 1 and 8, figure 1 of Silfvast discloses generating pulsed laser(30) radiation with a chosen power, pulse width and wavelength, generating atoms/ions and directing the laser radiation into the atoms/ions so that an atomic excitation is produced where selected inner-shell electron atomic electrons are removed from the atoms without the removal of all of the electrons in the next outermost shell, thereby generating a hollow atom array having a population inversion from which a chosen wavelength of radiation is emitted and amplified(col. 2, lines 47-49), and wherein a self-trapped plasma channel region(28) having a nonlinear mode of confined propagation for the chosen wavelength of amplified radiation is formed.

Silfvast does not disclose controlling atomic clusters.

Lo discloses generating atomic clusters having a chosen size and density and controlling the density of the atomic clusters(col. 3, lines 55-62). Lo discloses controlling the density of plasma electrons(col. 4, lines 26-28) resulting in control of the pulse

width, wavelength and power of the laser radiation such that the chosen wavelength of amplified radiation is tunable over the wavelengths for the hollow atom array.

Claims 2 and 9, Silfvast discloses choosing the atomic size(determines the collision cross section) to minimize the laser intensity required to excite substantially all of the atoms in the cluster(col. 8, lines 16-34).

Claims 3-4 and 10-11, Silfvast discloses choosing the pulse width such that atomic excitation occurs on a timescale which is short compared with recombination processes in the plasma produced(col. 4, lines 14-21).

Claims 5 and 12, Silfvast discloses selecting the atoms so a chosen wavelength is emitted and amplified(col. 2).

Claims 6 and 13, Silfvast discloses the use of heavy atoms(col. 2, lines 26-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use controlled atomic clusters as disclosed in Lo with the device disclosed in Silfvast to obtain a laser emitting light in the x-ray spectrum(col. 3, lines 36-41).

3. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silfvast in view of Lo as applied to claim above, and further in view of Ota(6,594,334).

Silfvast and Lo do not disclose Xe atoms.

Claims 7 and 14, Ota discloses the use of Xe atoms for a laser(abstract) in the 248 nm spectrum(col. 5, lines 26-30) to suppress the deterioration of optical characteristics(col. 2, line 54).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Xe atoms as disclosed in Ota for the atomic clusters disclosed in Lo for

improved suppression of optical deterioration as disclosed in Ota.

Response to Arguments

4. Applicant's arguments filed July 27, 2005 have been fully considered but they are not persuasive.

5. The content of figure 3 and columns 3-5 of the specification is not relevant to the patentability of the claims of this application since the discussed content of these portions of the specification is not recited in the claims of this application.

6. The claims do not recite that the emitted coherent radiation is in the x-ray band. It is stated in the claim preamble that the device maybe used to emit radiation in the x-ray band, but this statement appears to be only an intended use for the device.

7. Also, Silvast does disclose emitted coherent radiation at 840 angstroms(col. 5, line 13) which is close enough to the x-ray region so that that a choice of materials to permit x-ray operation would be obvious over the Silvast disclosure.

8. The device disclosed in Lo can adequately function when combined as noted above. Lo also discloses proper motivation for such a combination as referenced above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Jim Vannucci whose phone number is (571) 272-1820.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications only may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 872-9306.

James Vannucci